



## Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact [support@jstor.org](mailto:support@jstor.org).

tion to the great size of the anterior vertebræ in the cervical region, and the peculiar long, slender coracoids which are ankylosed with the much reduced sternum. The figure accompanying the text shows the probable position of the scapula in relation to the coracoid, the coraco-scapular angle being very obtuse, as in most flightless birds; the humerus is proportionally small, and its pectoral crest is reduced to a mere tubercle. (Geol. Mag., London, June, 1896.)

GENERAL.—According to C. D. Perrine, thirty-three distinct earthquakes were felt in California during the year 1894. This does not include a series of over one hundred shocks in Virginia, Nev., during the week of November 16–22, nor heavy earthquakes and volcanic disturbances which occurred in the New Hebrides group of islands during October and November. (Bull. U. S. Geol. Surv., No. 129, Washington, 1895.)

---

## BOTANY.<sup>1</sup>

**The Teaching of Elementary Botany.**—That the teaching of elementary botany in this country is, to say the least, very poor, is a statement which needs no argument to prove its correctness. Much of the botany of the public schools is a wretched attempt at doing something which neither teachers nor pupils understand. In some places the pupil is made to con the pages of a text-book in which emphasis is laid upon minute and meaningless anatomical details of the structure of a few flowering plants. Elsewhere field-work, so-called, is required of the pupil; but here again the chaff is carefully separated from the grain, and *the pupil is given the chaff*. Thus he is made to fill out vacancies in blanks (called “schedules”) in which the unimportant structural characters receive as much attention as those which are significant, the result being a description which neither describes nor separates the plant under consideration from dozens of others. The meaning of any structure is entirely overlooked, while the pupil is compelled to give much time and labor to unimportant details.

There are two reasons for this condition of things: first, the little knowledge of the science of Botany possessed by many teachers; and second, the absence of any definite idea on the part of teachers of the culture-value of Botany in the education of the pupil. To remedy the first the colleges and universities are opening summer schools for

<sup>1</sup> Edited by Prof. C. E. Bessey, University of Nebraska, Lincoln, Nebraska.

teachers; and in these, for the most part, something of modern Botany is given. Many years of personal experience has shown the writer that in one Western State it has been possible to do much in the way of improving the teaching of Botany through the agency of the summer school. Let not the teachers of Botany in the colleges and universities grudge the time given to work in the summer school. The additional work is doubtless the most productive work of the year, for, if it be well done, its effects will be felt by hundreds of pupils in many schools. Let professors put their best efforts and their most mature thought into this work.

The remedy for the second obstacle may be looked for in the movement in the National Educational Association, which resulted in the organization of a Department of Natural Science Instruction, whose first meeting was held recently in Buffalo. It was notable that every paper presented at this meeting emphasized the culture-value of Science, and this was especially marked in those dealing with Botany in the school curriculum. We, who teach in the larger colleges and universities, have been remiss in not setting forth more prominently and forcibly the culture-value of Science, and botanists have sinned equally with the others. It is high time that we not only teach Botany for the culture which it gives the student, but we should by lectures, public addresses, and by popular articles, show how it may be presented so as to insure culture. Here we have a duty to perform, and if we have the interest of Science truly at heart, we will not shrink from the labor which this duty imposes. Let every professor of Botany realize that through the new department of the National Educational Association he may influence the teaching of his science so that it may have a culture-value.—CHARLES E. BESSEY.

**The Conifers of the Pike's Peak Region.**—It may help the visitor to Colorado Springs and Manitou to know that the following conifers are more or less common in the adjacent mountains. Perhaps, when he learns that through the carelessness of man enormous forests of these trees have been burned from the sides of Cheyenne Mountain, Cameron's Cone and Pike's Peak, and that where once grew dense forests of conifers, with their power of conserving the moisture of the snows and rains, there grows the worthless "popple" (*Populus balsamifera candicans*), he, too, will be ashamed of man, the vandal, who has destroyed forever, I fear, the conifer forests of this region, with the destruction of which forests there has been a decrease in the volume of water in the mountain streams, while at the same time the sudden and dangerous floods which rush down the mountain sides have greatly increased.

*Juniperus communis alpina*, the Mountain Juniper, is common everywhere from 7000 feet altitude to timber-line (11,500), as a low, spreading and almost trailing shrub.

*Juniperus occidentalis monosperma*, the Brown Cedar, or more commonly called here by the erroneous name of White Cedar, is common in the Garden of the Gods.

*Juniperus virginiana*, the Red Cedar, is to be found in the Garden of the Gods and generally at low altitudes. Some of the trees are entirely clothed with the short, blunt leaves, giving them a smoothness not generally seen in this species. Such trees are more glaucous, and are more round-topped than the ordinary kind in which many of the leaves are sharp-pointed.

*Abies concolor*, the White Fir, occurs abundantly from about 7000 feet to 8000 or 10,000 feet above sea level. Its beautiful layered foliage and erect cylindrical cones make it an object of interest to every traveller.

*Pseudotsuga taxifolia* (*P. douglasii* of Coulter's Manual), the Douglas Fir, is the most common of the single-leaved conifers, occurring everywhere from the foot of the mountains to timber-line. It is distinguished at once by its elliptical cone, with trifid bracts between the scales.

*Picea engelmanni*, Engelmann's Spruce, and *P. pungens*, the Sharp-leaved Spruce, are common from 7000 or 7500 feet up to 9000 or 10,000 feet altitude on the eastern slopes of Pike's Peak.

*Pinus flexilis*, the Rocky Mountain White Pine, occurs from Cheyenne Mountain to Pike's Peak, from 7000 feet to timber-line, where it is very common. It may readily be distinguished by its leaves, *which are in fives*.

*Pinus balfouriana aristata*. This tree resembles the preceding, and apparently is often confused with it under the name of "White Pine" or "Foxtail Pine." It grows at high altitudes (10,000 feet) up to timber-line, and in this region is a small, or at most, a moderate-sized tree. Its short leaves (about one inch) which are in fives, and prickly cones distinguish it from all other species.

*Pinus edulis*, the Nut Pine, is a low, spreading tree, often not more than ten or twelve feet in height. It may be distinguished by its short leaves and small cones, the latter containing a few large edible seeds. It is common in the Garden of the Gods and on the foot-hills a few hundred feet higher.

*Pinus ponderosa scopulorum*, the Rocky Mountain Yellow Pine, or more commonly called the Bull Pine, is the most abundant conifer of the region. It grows at all elevations, from the foot of the mountains and foot-hills to timber-line. Its leaves are long, and occur in twos and less commonly in threes.—CHARLES E. BESSEY.

**Ferns Near Colorado Springs, Colorado.**—So many thousands of travellers visit the beautiful city of Colorado Springs every year that the following list of the ferns to be found within easy walking distance from the end of the car lines may be of interest to botanical readers.

*Notholaena fendleri* Kunze.

*Pteris aquilina* L.

*Cheilanthes tomentosa* Link.

*C. fendleri* Hook.

*C. gracilis* (Fee.) Mett.

*Pellaea atropurpurea* (L.) Link.

*Asplenium trichomanes* L.

*A. filix-foemina* (L.) Bernh.

*A. septentrionale* (L.) Hoffm.

*Phegopteris dryopteris* (L.) Fee.

*Dryopteris filix-mas* (L.) Schott.

*Cystopteris fragilis* (L.) Bernh.

*C. fragilis dentata* Hook.

*C. bulbifera* (L.) Bernh.

*Woodsia scopulina* D. C. Eaton.

*W. oregona* D. C. Eaton.

*W. obtusa* (Spreng) Tore.

*Botrychium virginianum* (L.) Swz.

*B. matricariaefolium* A. Br.

A few notes on the above list may be of interest. There is a good deal of individuality about the Colorado climate, and the same is true of its ferns and their habits. The *Woodsia* and the *Pteris* are almost the only ferns found on the open hillsides, and these but sparingly; the others seek the protection of the mountain cañons. Most of them prefer cañons opening toward the north. During three summers spent in Colorado I do not remember finding a single fern in any canon opening toward the south.

In *Notholaena fendleri* we are told that the pinnules are oval in mature specimens. In most young fronds I have found them deltoid or spatulate, and in some beautiful specimens this form is retained. In such ferns the stipes are lighter in color and weight, the zigzag course of the rachis is less pronounced, the pinnæ are more distant, and the pinnules less numerous, giving the specimens a much lighter and more graceful appearance. The departure from the normal form is worth noting, but not sufficient to constitute a variety.

*Cheilanthes tomentosa*, according to the books, is from eight to fifteen inches in length at maturity. Most specimens live up to the rule, but

not a few ignore the books, and mature their fruit before they are eight inches tall; indeed, some very saucy specimens refuse to grow beyond a single inch, and scatter their spores to the winds in spite of their insignificant size.

The two ferns named above are to be found in most of the shady cañons near Colorado Springs, but *Asplenium trichomanes* I have found only in one place in South Cheyenne canon, while *A. septentrionale* has not been seen outside of the beautiful gulch in the Ute Pass, from which the city of Manitou obtains its water supply. All the lower canons of the Ute Pass would be rich fields for the botanist if the vandal tourist could be kept out of them; as it is, there are still a few treasures left on the high rocks and in out of the way corners. Here *Phegopteris dryopteris* flourishes and *Cystopteris* runs riot.

The two Botrychiums were found in North Cheyenne Cañon, *B. virginianum* four, and *A. matricariaefolium* eight miles from the mouth of the cañon. Naturally, such fleshy ferns are seldom found in the dry atmosphere of Colorado, yet, in the one station where found, *B. matricariaefolium* was quite plentiful, and varied in form from a simplex-like plant of two inches to beautiful specimens nine inches high.

Of *Cystopteris fragilis* Eaton wisely wrote "very variable." The same might well be written of the whole genus so far as Colorado is concerned. It is the most abundant fern on Cheyenne Mountain, and there flourishes with little regard for the specific fences within which the books expect it to grow. I have not included *C. montana* (Lam.) Bernh. in the above list, because specimens found are hardly as broad as the typical form that species demands, while too broad to be classed as *C. fragilis*. The *C. bulbifera* found is without bulbs, but otherwise conforms to the books. The "winged" or "wingless rachis" of the books is not an unfailing test in differentiating the Colorado species of this genus, a microscopical examination of the indusium being necessary.

But if the Colorado *Cystopteris* is "very variable" what shall I say of *Woodsia*? I have entered *W. scopulina*, *W. obtusa* and *W. oregona* on the above list, because from the large amount of material on hand it is easy to select specimens which exactly conform to the species type in the books. I believe also that some specimens answering to *W. mexicana* might be selected, while a few would almost pass for *W. alpina*. But when this has been done what are we to call the still larger number of specimens, which are not exactly *W. scopulina*, nor *W. oregona*, nor *W. mexicana*, nor *W. obtusa*? Shall we say they are *Woodsia*, simply *Woodsia*, and nothing more? It seems to me that in this genus there is work waiting to be done of the same wise sort that Mr. George E. Davenport did some years ago in the genus *Botrychium*.—ALFORD A. BUTLER.